

**REMARKS**

Upon entry of the present Reply, claims 1-10, 14-25, 27-29, 31, 32 and 34-49 are pending in the application. Claims 1, 10, 25, 29, 32 and 34 are amended and claims 12, 26, 30 and 33 are cancelled herein. Support for the amendment of the independent claims may be found, for example, in the claims as originally filed and at page 22, lines 10-14. New claims 45-49 are added herein. Support for the new claims may be found in the specification, for example, at page 20, lines 2-4 and page 16, lines 18-19.

Applicant respectfully submits that all of the claims are allowable over the prior art of record in this application and Applicant respectfully requests the Examiner to withdraw the rejections of all of these claims and to allow all of them.

**Rejection of Claims 1-4, 9, 35 and 40 over Bloch.**

In the Office Action dated 15 August 2008, claims 1-4, 9, 35 and 40 were rejected as obvious over Bloch, US 3043771. Applicant respectfully traverses this rejection for at least the following reasons.

Bloch discloses a process in which a sludge is contacted with clay particles suspended in a liquid, and the particles having sludge deposited thereon are separated by gravity, on the basis that the particles having sludge deposited thereon have a different settling rate than the clay particles that do not have the sludge deposited thereon. See, col. 2, lines 40-53. The overall particle mass is thus maintained in a fluidized state, the sludge-rich particles being carried to the upper portion of the particle separation zone to form a sludge-rich phase, and the sludge-lean particles descending to form a sludge-lean phase in the lower portion of the particle separation zone. See, col. 4, lines 50-57. This is clearly not a packed column, and the contacting is clearly not conducted with clay in a packed column.

Applicant's claims, e.g., claim 1, recite "contacting the hydrocarbon-containing material with a clay packed in a column...". This feature of the claimed invention fully distinguishes the claimed invention from anything disclosed or suggested in Bloch.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 1-4, 9, 35 and 40 over Bloch.

**Rejection of Claims 1-7, 9, 10, 12 and 14-44 over Yoshida in view of Hutson.**

In the Office Action dated 15 August 2008, claims 1-7, 9, 10, 12, and 14-44 were rejected as obvious over the basic combination of Yoshida and Hutson, and in some cases, further in view of Bloch, Klepfer (US 6184427) or Bullock (US 6653517). Applicant traverses the rejections of the claims over Yoshida and Hutson, with or without Bloch, Klepfer or Bullock, for at least the following reasons.

None of the cited references disclose or suggest in any way that the processes disclosed could include the process as presently claimed, including heating the clay and the clay-contaminant adduct to a temperature in a range from about 400°C to about 815°C to regenerate the clay material, and providing the regenerated clay material from the regeneration step for reuse in the contacting step, wherein the clay is capable of sorbing the source-derived contaminant through at least 300 cycles of regeneration and reuse.

As admitted in the Office Action, Yoshida fails to disclose (or suggest) that any clay and clay-contaminant adduct are heated to regenerate the clay adsorbent material which is then recycled and reused in the contacting step. In fact, Yoshida does not even disclose clay as a filtering means for removing contaminants. Yoshida discloses, at col. 8, lines 31-42, adding a "white inorganic filler to wastes treated to increase the decomposition rate and the decomposition efficiency and to improve the uniformity of the properties of the recovered oils". This "white inorganic filler" thus functions something like a catalyst, to improve the decomposition, not as a filter media to remove contaminants from the oil. While it is true that one of the "white inorganic filler" materials may be aluminum silicate clay, this does not make Yoshida at all the same as or similar to Applicant's invention. To any reasonable, non-hindsight-based view of Yoshida, the "white inorganic filler" is clearly added as an aid to decomposition, e.g., a

catalyst, not in any way to remove contaminants *per se*. In Yoshida, the "white inorganic filler" (which may be clay) constitutes a contaminant that must be removed, which is a far cry from constituting the means for removing other contaminants, as in the present invention.

The Office Action cited Hutson as allegedly teaching the use of adsorbent clay, heating the clay and recycling the clay for further use. The Office Action contends that it would have been obvious to have increased the clay heating temperature disclosed by Hutson to reach Applicant's claimed heating the clay-contaminant adduct to a temperature in a range from about 400°C to about 815°C. Applicant respectfully traverses this rejection and disagrees that any such temperature would have been obvious from Hutson. Furthermore, Hutson does not use clay packed in a column for the contacting, as claimed.

Hutson discloses removing metal halides, such as aluminum chloride from alkylation reactions, by passing a mixture to a zone containing a support for the halides having a non-loaded adsorbing surface, to remove the halides by adsorption. Periodically, the metal halides are removed from the supporting materials to regenerate the supporting materials. Col. 2, lines 5-25. The supporting materials may be clay. Col. 2, lines 26-32. To regenerate the supporting material, a suitable solvent is used to flush the metal halides, and then the solvent is removed. Col. 2, line 56 to col. 3, line 3. The regeneration cycle is disclosed at col. 4, lines 1-11, wherein the material is washed first with benzene at ambient temperature and then with benzene at a temperature of 375°F (190°C). This is the maximum regeneration temperature disclosed or suggested by Hutson. There is no suggestion in Hutson to increase the temperature to any higher temperature, much less to a temperature over 200°C higher. There can be no reasonable contention that a person of ordinary skill in the art would attempt to increase the temperature to such a level, if the process works at the lower temperature, as well as for safety reasons. Attempting to use any solvent, and especially benzene, at a temperature of 400°C or higher would be foolhardy and against good engineering practices.

Furthermore, there is nothing in Hutson to suggest that the clay would be used in a packed column, as claimed. Although Hutson does not specify the form of the clay, in the lone example, Hutson discloses that a coalescer and adsorber used to contact the effluent has a volume of 2.0 gallons, and the total quantity of clay charged to the coalescer and adsorber is 9.3 lbs. Given that the density of compacted clay (according to the website [http://www.simetric.co.uk/si\\_materials.htm](http://www.simetric.co.uk/si_materials.htm) is about) is  $1746 \text{ kg/m}^3$  (about 233 ounces per gallon), then  $9.3 \times 16 = 148.8$  ounces,  $148.8 \text{ ounces} / 233 \text{ ounces/gallon} = 0.64$  gallon of clay charged to the 2 gallon volume of the coalescer or adsorber. This is not at all similar to clay packed in a column. This, further in view of the flow diagram in Hutson's drawing, showing the flow into the adsorber is from the bottom up, leaves no doubt that Hutson does not have clay packed in a column. Hutson's subsequent flushing of the metal halides from the clay may constitute a regeneration step, but it is nothing that bears any reasonable similarity to Applicant's disclosed and claimed regeneration. The mere mention of regeneration cannot reasonably be asserted to include or imply every possible type of regeneration, but this sort of unreasonable leap of logic is necessary to support the contention of obviousness in the Office Action.

The Office Action cobbles together selected disclosures from Yoshida and Hutson to reach a clearly erroneous and without support of substantial evidence conclusion that the claimed invention would have been obvious. As noted above, Yoshida does not use a clay adsorbent. Yoshida may use clay, but not as an adsorbent, rather Yoshida used the clay as a catalyst. The only "residue removal step" in Yoshida is to separate the metal halides formed by reaction of hydrogen halides with alkaline metal earth hydroxides, which are the "white inorganic filler" in that embodiment. The closest that Yoshida comes to actually describing a "residue removal step" is from col. 7, line 43 to col. 8, line 12. In this description, it appears that the "residue removal step" consists of passing the residues, together with some portion of the decomposing material, to an "even higher temperature ( $T_3$ ) than the heating temperature ( $T_2$ ) in the decomposing means to remove the residues from the removal means", leaving behind a small volume of residue. See, col. 8, lines 1-5. This has no

resemblance whatsoever to the process disclosed and claimed by Applicant. From Yoshida's Examples 15 and 16, it is plain that the "white inorganic filler" is added as a catalyst, to avoid the formation of disagreeable odors in the dry-distilled product. This is not at all similar to Applicant's claimed invention.

Applicant respectfully submits that it is simply not reasonable to read Yoshida and Hutson together in any way that could support a legally correct conclusion that the claimed invention would have been obvious. There is nothing in these references would have led a person of ordinary skill in the art, at the time the invention was made, and without benefit of Applicant's disclosure as a guide, to have found it obvious to make the presently claimed invention.

Accordingly, Applicant respectfully submits that the combined prior art references applied in the Office Action to which this Reply is responsive cannot have rendered obvious any of the pending claims, in any of the asserted combinations, with or without the tertiary references. For this reason, Applicant respectfully submits that all of the presently pending claims fully distinguish over the prior art and are in condition for allowance.

#### **Claim Objections.**

Claims 1, 29 and 32 have been amended to correct the antecedent basis issues pointed out in the Office Action.

Claims 32 and 34 have been amended to correct the issue relating to non-sequentiality. Although Applicant respectfully submits that any person of ordinary skill in the art would have readily understood the claim sequence, in order to advance prosecution of the application, Applicant has amended claim 32 to remove the indicia relating to step order, and has also amended claim 34 correspondingly.

#### **Claim Rejections Under 35 U.S.C. §112, Second Paragraph.**

In the Office Action, for the first time after over two and one-half years of prosecution, the (new) Examiner has now raised objection to various terms in claims 4,

5, 18, 19, 25, 29, 32 and 35-39. Applicant respectfully both objects to the Examiner's very untimely objection, and traverses the contention that the objected-to terms are in any way indefinite.

This application has been on file for over five years. This application has been in prosecution, due to a series of asserted and subsequently withdrawn rejections by the Office, for a period of over two and one-half years. This is the fifth Reply to Office Action. Applicant respectfully submits that any such objection to the terminology of the specification and claims should have been raised long ago, and that to do so at this point is both unfair and prejudicial. The previous Examiner never raised any objection to these terms. That a newly appointed Examiner should raise objection at this point can only be considered untimely. The objection is prejudicial in that Applicant has proceeded through this entire prosecution without having to deal with the contention that some of the terms used throughout the specification and claims are indefinite.

For this reason alone, the rejections of the claims under 35 U.S.C. §112, second paragraph should be withdrawn.

In addition to the foregoing, Applicant respectfully submits that any person of ordinary skill in the art reading the specification and claims of this application in a reasonable attempt to understand the terms alleged to be indefinite and to define the metes and bounds of the claims would readily and easily understand these terms.

Regarding the terms "a refinery-grade hydrocarbon" and "a refinery-grade material", these terms plainly mean that the product is substantially the same as or equivalent to a similar product obtained from the usual refining process. Thus, for example, a diesel-grade product obtained by the process of the present invention, in one embodiment, would meet all of the usual requirements for a diesel-grade fuel. Similar considerations apply to other fractions, e.g., gasoline or lubricating oil, that could be obtained from the process. Applicant respectfully submits that there is nothing indefinite about these terms and that they would be readily understood by the skilled person, to whom the application is directed.

Regarding the terms "one or more characteristic out of specification for a desired use" or "one or more characteristic requiring adjustment for a desired use", and "one or more off-specification characteristic relating to use in a motor vehicle" and "one or more characteristic for offsetting the one or more off-specification characteristic", similar considerations apply. Plainly, the thus-described material has one or more characteristic that does not meet the usual requirements for a similar product, e.g., a refinery-grade hydrocarbon. The material is adjusted by addition of an offsetting material, to correct the out-of-specification characteristic to bring it back into line with refinery-grade requirements. Such adjustment, e.g., blending, is described, for example, at pages 30-36 of the specification. Thus, for example, as described at page 32, lines 12-26, where a flash point of a hydrocarbon material such as a diesel fuel is out of specification, the hydrocarbon material may be blended with another hydrocarbon material to bring the mixture within the specification for flash point. At page 34, lines 15-16, various characteristics are mentioned.

For the foregoing reasons, Applicant respectfully submits that the terms discussed above are not indefinite, that any person of ordinary skill in the art would readily understand these terms, and that use of these terms in the claims do not render the claims indefinite. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this ground of rejection of claims 4, 5, 18, 19, 25, 29, 32 and 35-39.

### **CONCLUSION**

As shown by the foregoing, Applicants respectfully submit that the presently disclosed and claimed invention patentably distinguishes over the asserted prior art. Accordingly, Applicants request the Examiner to withdraw the previously stated rejections and to allow the present claims.

If any issues remain, or if the Examiner considers that a telephone interview would be helpful to facilitate favorable prosecution of this application, the Examiner is invited to telephone the undersigned attorney. Applicant respectfully requests the

Examiner to telephone the undersigned to discuss any additional changes that may be made to facilitate allowance of the present application.

It is believed no additional fee is required for this filing, since the fee for a total of 44 claims has been paid (34 total claims on filing and 10 new claims in the Reply filed 16 June 2006), and a total of 43 claims are now pending in the application. However, if any additional fee is required, please charge the fee to Deposit Account No. 18-0988, Order No. ORRCP0100US.

Respectfully submitted,  
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